IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Appeals and Interferences

In re the Application of

Inventors: Eric PEYRUCAIN et al.

Appln No.: 10/781,910

Filed: February 20, 2004

For: METHOD AND DEVICE TO ASSIST IN THE PILOTING OF AN AIRCRAFT IN A NON-PRECISION APPROACH DURING A LANDING PHASE

APPEAL BRIEF

On Appeal From Art Unit 3641
Examiner Lee, Benjamin P.
Confirmation No. 5420

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TABLE OF AUTHORITIES

I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the present application, Airbus France of Toulouse, France.

II. RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences, or judicial proceedings known to Appellants, Appellants' legal representative, or the Assignee that may be related to, directly affect or be directly affected by, or have a bearing on the Board's Decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-38 have been presented for examination. Claims 1-20 have been canceled, claims 24-36 stand withdrawn as being directed toward non-elected subject matter, and claims 21-23, 37, and 38 stand finally rejected and form the subject matter of the present appeal.

IV. STATUS OF AMENDMENTS

No claim amendments were filed after the Final Rejection of February 6, 2008.

V. SUMMARY OF CLAIMED SUBJECT MATTER

An object of the claimed invention is to assist the piloting of an aircraft in a non-precision approach during a landing phase.

To achieve this or other objects of the invention, independent claim 21 defines a method to assist the piloting of an aircraft in a non-precision approach during a landing phase, wherein a series of successive steps is carried out automatically (see specification page 2, lines 16-18). The series of steps comprising: a) verifying, according to respective standards of operation, conditions relating to the correct functioning of a plurality of equipment 3A-3N of the aircraft

and to the integrity and precision of measurements of parameters used for implementing the non-precision approach, based on information coming from the plurality of equipment 3A-3N (see page 2, lines 19-24); b) selecting, on the basis of the verified conditions, one of a plurality of different non-precision approach categories (see page 2, lines 25-27); and c) presenting the selected approach category on a display screen 10 (see page 2, line 28). Each non-precision approach category defines the approach mode or modes that are possible from among a plurality of approach modes including a plurality of assisted approach modes and a selected approach mode (see page 2, lines 29-35). In step b) a first approach category is selected when the following conditions are verified simultaneously in step a) (see page 3, lines 28-29, and page 9, lines 17-19): two flight management computers of the aircraft are functioning correctly (see page 3, lines 30-31, and page 9, line 20); satellite positioning functions of two multimode landing assistance receivers of the aircraft are functioning correctly (see page 3, lines 32-33, and page 9, lines 21-22); at least two inertial reference systems of the aircraft, integrating aerodynamic data, are functioning correctly (see page 3, lines 34-35, and page 9, lines 23-24); at least one assisted approach mode function of at least one of the multimode landing assistance receivers is functioning correctly (see page 4, lines 1-2, and page 9, lines 25-26); an altitude value of the aircraft has a precision that is greater than a predetermined value (see page 4, lines 3-4, and page 9, lines 27-28); the integrity and precision of a position value of the aircraft are achieved (see page 4, lines 5-4, and page 9, lines 29-30); and a position of the aircraft, calculated by at least one of the flight management computers, and a position of the aircraft, received from a satellite positioning system, are consistent (see page 4, lines 7-9, and page 9, lines 31-33). If the selected approach category is the first approach category, a pilot may choose any one of the various

possible assisted approach modes as the approach mode for landing the aircraft (see page 10, lines 1-3).

Dependent claim 22 further limits the subject matter of claim 21 by reciting that the conditions verified in step a) include (see page 3, lines 7-8, and page 7, lines 10-11): verifying the correct functioning of an assisted approach mode function of each of the two multimode landing assistance receivers (see page 3, lines 13-14, and page 7, lines 16-17); verifying the correct functioning of each of three inertial reference systems, which integrate aerodynamic data (see page 3, lines 17-18, and page 7, lines 20-21); verifying the correct functioning of an attitude and direction indicator of the aircraft (see page 3, lines 19-20, and page 7, line 22); or verifying the uncertainty of the position value of the aircraft (see page 3, line 22, and page 7, line 24).

Dependent claim 23 further limits the subject matter of claim 21 by reciting that step a) further comprises verifying, according to a standard of operation, the correct functioning of an automatic pilot of the aircraft (see page 3, line 27, and page 7, line 29).

Independent claim 37 defines a device to assist in the piloting of an aircraft in a non-precision approach during a landing phase, the device comprising a means for verifying 4, according to respective standards of operation, conditions relating to the correct functioning of a plurality of equipment 3A-3N of the aircraft and to the integrity and precision of measurements of parameters used for implementing the non-precision approach, based on information coming from the plurality of equipment 3A-3N (see page 5, lines 5-14 and 28-32, and page 6, lines 1-6). A means for selecting 6, on the basis of the verified conditions, one of a plurality of different non-precision approach categories (see page 5, lines 15-17, and page 6, lines 6-11). A display means 8 for presenting the selected approach category on a display screen 10 (see page 5, lines

18-19, and page 6, lines 12-14). A means for selecting 6 a second approach category when the following conditions are verified simultaneously (see page 10, lines 4-6): at least one flight management computer of the aircraft is functioning correctly (see page 10, line 7); at least one inertial reference system of the aircraft, which integrates aerodynamic data, is functioning correctly (see page 10, lines 8-9); at least one assisted approach mode function of a multimode landing assistance receiver of the aircraft is functioning correctly (see page 10, lines 10-11); and a position value of the aircraft exhibits low uncertainty (see page 10, line 12). Each non-precision approach category defines the approach mode or modes that are possible from among a plurality of approach modes including a plurality of assisted approach modes and a selected approach mode (see page 8, lines 26-29).

Dependent claim 38 further limits the subject matter of claim 37 by reciting that the display screen 10 is a primary screen for piloting the aircraft (see page 5, lines 20-21, and page 6, lines 17-19). The display means 8 presents the selected approach category in a zone 12 of the primary piloting screen that is used for the display of an approach category during an instrument approach (see page 5, lines 21-24, and page 6, lines 19-21) .

The references above to the specification and drawing are for illustrative purposes only and are not intended to limit the scope of the invention to the referenced embodiments.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 21-23, 37, and 38 stand correctly rejected, under 35 USC §103(a), as being unpatentable over Gibbs et al. (US 6,856,864) in view of Harenberg, Jr. et al. (US 3,789,356).

VII. ARGUMENT

To establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. See *MPEP §2143.03, first sentence; In re Royka, 490 F.2d 981, 984-985, 180 USPQ 580, 583 (CCPA 1974)*. Rejections on obviousness cannot be sustained by mere conclusory statements. Instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. See, *KSR International v. Teleflex Inc.*, U.S. Supreme Court No. 04-1350 (April 30, 2007). *In re Kahn,* 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) *and* see MPEP §2143.01(I), first sentence of third paragraph.

As stated in *KSR*, exemplary rationales that may support a conclusion of obviousness include:

(A) Combining prior art elements according to known methods to yield predictable results;

(B) Simple substitution of one known element for another to obtain predictable results;

(C) Use of known technique to improve similar devices (methods, or products) in the same way;

(D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(E) "Obvious to try" - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

(F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;

(G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. See MPEP § 2143.

A. Obviousness Rejections of Claims 21-23 and 37

In the rejection of claim 21, the Final Rejection does not expressly apply any one of the above rationales. Instead, the Final Rejection appears to apply a combination of rationales (D) and (G), identified above. More specifically, the Final Rejection seems to find the claimed subject matter obvious over the prior art on the grounds that the applied references allegedly provide a teaching, suggestion, or motivation to modify Gibbs' system using a known technique that yields predictable results, as taught by Harenberg, so as to achieve the claimed subject matter. However, for the reasons discussed below, the Final Rejection's findings of fact articulated in support of the rejection do not support the Final Rejection's conclusion regarding the obviousness of claim 21. Specifically, the articulated findings of fact indicate that Gibbs and Harenberg suggest a combination of method steps that differ from those recited in claim 21. Thus, no matter how strong the Final Rejection's identified motivation may be to combine the teachings of Gibbs and Harenberg, the method achieved by this combination differs from and does not render obvious the claimed method.

Claim 21 defines a method of assisting the piloting of an aircraft during a non-precision landing approach. According to this method, a plurality of non-precision landing approaches are

selected for presentation on a display in accordance with verified conditions relating to the precision of measurements of parameters used in implementing the non-precision landing approach. More specifically, a first approach category, comprising a plurality of non-precision landing approaches, is selected for presentation when the following conditions are verified simultaneously:

(1) two flight management computers of the aircraft are functioning correctly;

(2) satellite positioning functions of two multimode landing assistance receivers of the aircraft are functioning correctly;

(3) at least two inertial reference systems of the aircraft, integrating aerodynamic data, are functioning correctly;

(4) at least one assisted approach mode function of at least one of the multimode landing assistance receivers is functioning correctly;

(5) an altitude value of the aircraft has a precision that is greater than a predetermined value;

(6) the integrity and precision of a position value of the aircraft are achieved; and

(7) a position of the aircraft, calculated by at least one of the flight management computers, and a position of the aircraft, received from a satellite positioning system, are consistent.

The Final Rejection acknowledges that Gibbs does not disclose verifying the seven conditions identified above so as to determine an approach category to be displayed (see Final Rejection section 7, lines 1-6). To overcome this deficiency, the Final Rejection proposes that Harenberg discloses a failure assessment monitor that generates a signal representative of the

position of an aircraft, with respect to a runway, based on sensor measurements of gyroscopes, air temperature, wind speed, fuel gauges, groundspeed, altitude, and horizontal distance (see page 5, lines 4-8 of second paragraph).

However, the disclosure within Gibbs' specification of monitoring gyroscopes, air temperature, wind speed, fuel gauges, groundspeed, altitude, and horizontal distance is not the same as the claimed limitation of verifying that two flight management computers of an aircraft are functioning correctly. Nor is this the same as the Applicants' claimed limitations of verifying that: (1) satellite positioning functions of two multimode landing assistance receivers of the aircraft are functioning correctly; (2) at least two inertial reference systems of the aircraft, integrating aerodynamic data, are functioning correctly; (3) at least one assisted approach mode function of at least one of the multimode landing assistance receivers is functioning correctly; (4) an altitude value of the aircraft has a precision that is greater than a predetermined value; (5) the integrity and precision of a position value of the aircraft are achieved; and (6) a position of the aircraft, calculated by at least one of the flight management computers, and a position of the aircraft, received from a satellite positioning system, are consistent.

Thus, Harenberg does not disclose verifying the above-mentioned conditions. Since neither Gibbs nor Harenberg discloses verifying the claimed conditions, it necessarily follows *per force* that Gibbs and Harenberg together cannot suggest verifying the claimed conditions when selecting a landing approach category to display, and the Final Rejection does not specifically propose otherwise.

Instead, the Final Rejection indicates that Harenberg discloses monitoring conditions different from the claimed conditions so as to make a different determination than that made

based upon the claimed conditions. More specifically, the Final Rejection proposes that Harenberg discloses determining a representation of an aircraft's position with respect to a runway based on a set of monitored conditions, whereas claim 21 recites determining a landing approach mode to display based upon an entirely different set of conditions.

Although the Final Rejection proposes that Gibbs discloses monitoring a plurality of data sources when selecting a landing approach mode (see Final Rejection section 5), the Final Rejection acknowledges that Gibbs does not disclose monitoring the above-mentioned conditions of claim 21 (see section 7, lines 1-6) and cites Harenberg for disclosing data sources that do not supplement the teachings of Gibbs in a way that is relevant to the claimed conditions.

The Final Rejection also proposes that Harenberg discloses displaying the operational availability and performance of monitored systems and monitoring flight instruments to determine if they are generating good information (see Final Rejection section 2, last seven lines). However, displaying the operational availability and performance of monitored systems is not the same as the claimed subject matter of verifying specific conditions for the purpose of determining a landing approach category to display. As for monitoring flight instruments to determine if they are generating good information, Harenberg does not disclose that the determination of good versus poor information is used to select a landing approach category to display.

In summary, the combined teachings of Gibbs and Harenberg suggest neither verifying the above-mentioned conditions recited in claim 21 nor the claimed purpose for monitoring these conditions. Thus, Gibbs and Harenberg, considered alone or together, fail to teach or suggest all

of the present claim features and fail to suggest a reason to modify Gibbs' system, in light of Harenberg's disclosure, so as to achieve the claimed subject matter.

Accordingly, Appellants submit that Gibbs and Harenberg, considered individually or in combination, do not render obvious the subject matter defined by claim 21. Independent claim 37 similarly recites the above-mentioned subject matter distinguishing method claim 21 from the applied references, but with respect to an apparatus. Therefore, reversal of the rejections applied to claims 21 and 27 is deemed to be warranted.

Dependent claims 22, 23, and 38 incorporate the above-mentioned subject matter distinguishing their respective base claims from the applied references. Therefore, reversal of the rejections applied to claim 22, 23, and 38 is similarly warranted.

B. Obviousness Rejection of Claim 22

Claim 22 depends from base claim 21 and further recites verifying an additional condition for the purpose of selecting the landing approach category to display. Specifically, claim 22 recites verifying (1) the correct functioning of an assisted approach mode function of each of the two multimode landing assistance receivers; (2) the correct functioning of each of three inertial reference systems, which integrate aerodynamic data; (3) the correct functioning of an attitude and direction indicator of the aircraft; or (4) the uncertainty of the position value of the aircraft.

The Final Rejection provides no specific findings of fact to support its conclusion that Gibbs and Harenberg suggest verifying one or more of the additional conditions recited in claim 22. Moreover, the Final Rejection does not specify why a skilled artisan would be motivated to

modify Gibbs' system, with the teachings of Harenberg, so as to implement the verification of the conditions recited in claim 22.

Accordingly, Appellants submit that Gibbs and Harenberg, considered individually or in combination, do not render obvious the subject matter defined by claim 22. Therefore, reversal of the rejection applied to claim 22 is warranted.

C. Obviousness Rejection of Claim 23

Claim 23 depends from base claim 21 and further recites verifying, according to a standard of operation, the correct functioning of an automatic pilot of the aircraft.

The Final Rejection provides no specific findings of fact to support its conclusion that Gibbs and Harenberg suggest verifying the additional condition recited in claim 23. Moreover, the Final Rejection does not specify why a skilled artisan would be motivated to modify Gibbs' system, with the teachings of Harenberg, so as to implement the verification of the condition recited in claim 23.

Accordingly, Appellants submit that Gibbs and Harenberg, considered individually or in combination, do not render obvious the subject matter defined by claim 23. Therefore, reversal of the rejection applied to claim 23 is warranted.

D. Obviousness Rejection of Claim 38

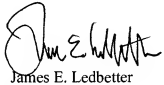
Claim 38 depends from base claim 37 and further recites that the display screen is a primary screen for piloting the aircraft and the display means presents the selected approach category in a zone of the primary piloting screen that is used for the display of an approach category during an instrument approach.

The Final Rejection provides no specific findings of fact to support its conclusion that Gibbs and Harenberg suggest displaying a non-precision landing approach category on the primary piloting screen of an aircraft or displaying this information in a zone of the screen used for the display of an approach category during an instrument landing. Moreover, the Final Rejection does not specify why a skilled artisan would be motivated to modify Gibbs' system, with the teachings of Harenberg, so as to implement the claimed subject matter.

Accordingly, Appellants submit that Gibbs and Harenberg, considered individually or in combination, do not render obvious the subject matter defined by claim 38. Therefore, reversal of the rejection applied to claim 38 is warranted.

In view of the law and facts stated herein, it is respectfully submitted that all rejected claims define patentable subject matter. Therefore, reversal of all outstanding grounds of rejections is respectfully solicited.

Respectfully submitted,



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VIII. CLAIMS APPENDIX

21. A method to assist the piloting of an aircraft in a non-precision approach during a landing phase, wherein a series of successive steps is carried out automatically, the series of steps comprising:

a) verifying, according to respective standards of operation, conditions relating to the correct functioning of a plurality of equipment of the aircraft and to the integrity and precision of measurements of parameters used for implementing the non-precision approach, based on information coming from the plurality of equipment;

b) selecting, on the basis of the verified conditions, one of a plurality of different non-precision approach categories; and

c) presenting the selected approach category on a display screen, wherein:

each non-precision approach category defines the approach mode or modes that are possible from among a plurality of approach modes including a plurality of assisted approach modes and a selected approach mode,

in step b) a first approach category is selected when the following conditions are verified simultaneously in step a):

two flight management computers of the aircraft are functioning correctly;

satellite positioning functions of two multimode landing assistance receivers of the aircraft are functioning correctly;

at least two inertial reference systems of the aircraft, integrating aerodynamic data, are functioning correctly;

at least one assisted approach mode function of at least one of the multimode landing assistance receivers is functioning correctly;

an altitude value of the aircraft has a precision that is greater than a predetermined value;

the integrity and precision of a position value of the aircraft are achieved; and

a position of the aircraft, calculated by at least one of the flight management computers, and a position of the aircraft, received from a satellite positioning system, are consistent, and

if the selected approach category is the first approach category, a pilot may choose any one of the various possible assisted approach modes as the approach mode for landing the aircraft.

22. The method of claim 21, wherein the conditions verified in step a) include:

verifying the correct functioning of an assisted approach mode function of each of the two multimode landing assistance receivers;

verifying the correct functioning of each of three inertial reference systems, which integrate aerodynamic data;

verifying the correct functioning of an attitude and direction indicator of the aircraft; or

verifying the uncertainty of the position value of the aircraft.

23. The method of claim 21, wherein step a) further comprises verifying, according to a standard of operation, the correct functioning of an automatic pilot of the aircraft.

37. A device to assist in the piloting of an aircraft in a non-precision approach during a landing phase, the device comprising:

a means for verifying, according to respective standards of operation, conditions relating to the correct functioning of a plurality of equipment of the aircraft and to the integrity and precision of measurements of parameters used for implementing the non-precision approach, based on information coming from the plurality of equipment;

a means for selecting, on the basis of the verified conditions, one of a plurality of different non-precision approach categories;

a display means for presenting the selected approach category on a display screen; and

a means for selecting a second approach category when the following conditions are verified simultaneously:

at least one flight management computer of the aircraft is functioning correctly;

at least one inertial reference system of the aircraft, which integrates aerodynamic data, is functioning correctly;

at least one assisted approach mode function of a multimode landing assistance receiver of the aircraft is functioning correctly; and

a position value of the aircraft exhibits low uncertainty, wherein:

each non-precision approach category defines the approach mode or modes that are possible from among a plurality of approach modes including a plurality of assisted approach modes and a selected approach mode.

38. The device of claim 37, wherein:

the display screen is a primary screen for piloting the aircraft; and

the display means presents the selected approach category in a zone of the primary piloting screen that is used for the display of an approach category during an instrument approach.

IX. EVIDENCE APPENDIX

There is no evidence submitted pursuant to 37 CFR §§1.130, 1.131, or 1.132 of this title or any other evidence entered by the examiner and relied upon by Appellants in the appeal.

X. RELATED PROCEEDINGS APPENDIX

There are no decisions rendered by a court or the Board in any proceeding identified pursuant to 37 CFR §41.37(c)(1)(ii).